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CORRESPONDENCE

Pseudoischemic electrocardiography: Cardiac metastasis masquerades as myocardial infarction

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A man 37 years of age was found to have chest tightness, shortness of breath, and diaphoresis during hospitalization for chemotherapy for metastatic buccal cancer (squamous cell carcinoma) on March 18, 2012. The electrocardiography (ECG) showed ST-segment elevation over V3–V5 leads (Fig. 1B), which was absent on the baseline ECG 1 year ago (Fig. 1A). Although cardiac enzymes were within normal limits, ST-segment elevation myocardial infarction was highly suspected. However, the patient hesitated about coronary angiography due to his terminal cancer status and renal insufficiency (estimated glomerular filtration rate: 29.7 ml/minute/1.73m^2).

Follow-up ECG showed persistent ST-segment elevation without dynamic change. Cardiac enzymes showed extremely low troponin-I value (<0.04 ng/ml at 6 hours, 12 hours, 18 hours, and 24 hours after the initial symptoms). Myocardial perfusion scan revealed persistent deficits in the apex and apicoinferior walls of the left ventricle (LV). Transthoracic echocardiography found a hyperechoic, heterogeneous mass over LV apex. Chest computed tomography (CT) revealed a 3.8 × 3.7 × 4.2 cm hypoattenuating, polypoid mass at LV apex, attached to myocardium, with pericardium involvement (Fig. 1D). Metastasis at left adrenal gland and right kidney were also found. After discussing with the patient, he decided to receive palliative care. The patient was discharged after recovery from the postchemotherapy leucopenia. He then received palliative care at home and eventually succumbed to the metastatic cancer 2 months later.

Cardiac neoplasms can be classified as primary or secondary tumors. Primary cardiac tumors are rare (approximately 0.02–0.056% of autopsy series),[1] including myxoma, rhabdomyoma, and various sarcomas. Secondary, metastatic tumor occurs 50-fold more commonly (incidence of 1.23% in autopsy reports).[1] Lung cancer is the most common origin (36% of cardiac metastasis). Lymphoma (20%), breast cancer (7%), and esophageal cancer (6%) were also reported.[2] Clinical manifestation includes a wide range

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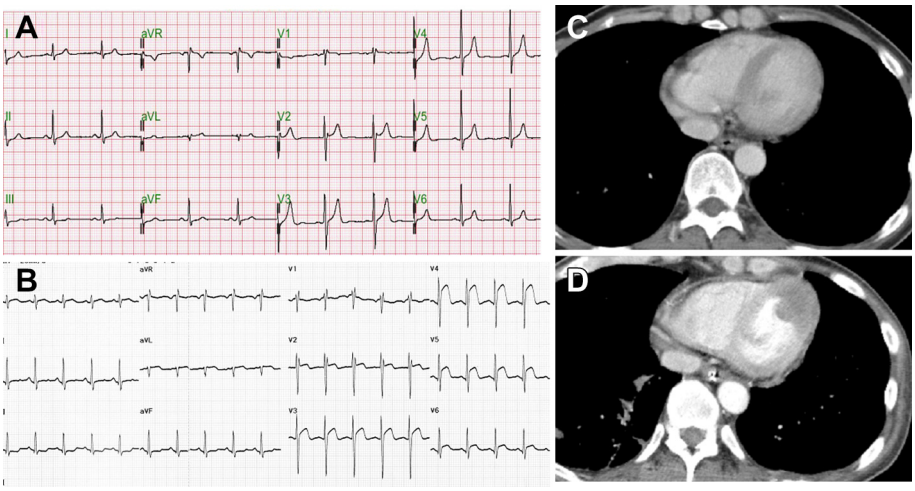

Figure 1 Compared with the baseline electrocardiography on (A) October 18, 2011, ST-segment elevation on V3—V5 was found while the patient complained of chest tightness and diaphoresis; (B) on March 18, 2012. No cardiac mass was found in the images taken on (C) March 11, 2011. Chest computed tomography in axial view revealed a 3.8 × 3.7 × 4.2 cm low-density polypoid mass at the left ventricular apex with invasion of the myocardium and pericardium on (D) March 21, 2012.

of symptoms, from totally asymptomatic to life-threatening heart failure and thromboembolism. Of note, arrhythmia, includes ST-T-wave change, is a less common manifestation but happens to be the most prevalent expression of myocardial involvement.[3] The most common causes of nonischemic ST-segment elevation are left ventricular hypertrophy, left bundle-branch block, early repolarization, and ventricular aneurysm.[4] Cardiac metastasis is a rare but important differential diagnosis in patients with known metastatic cancer.

Echocardiography is the preferred initial imaging modality for survey of cardiac neoplasm. Magnetic resonance imaging (MRI) of the heart provides excellent anatomic detail in terms of size, shape, and extent of infiltration of myocardial tumors. CT is more sensitive than MRI in detecting calcification and distinguishing possible coronary artery disease, but its efficacy in tissue characterization is inferior to MRI.[5] However, the ultimate diagnosis is still based on typical histopathologic features.

Most primary cardiac tumors can be removed by surgery and have excellent prognosis, whereas metastatic cardiac tumors are unresectable and resorted to only palliative care. As cancer patients live longer, the incidence of cardiac metastasis will keep increasing. For early diagnosis of potential life-threatening complications, an unexplained, persisting ECG change should be regarded as a hint for possible cardiac metastasis in patients with extensively metastatic cancer.

References

1. Lam KY, Dickens P, Chan AC. Tumors of the heart. A 20-year experience with a review of 12 485 consecutive autopsies. *Arch Pathol Lab Med* 1993;**117**:1027—31.
2. Chiles C, Woodard PK, Gutierrez FR, Link KM. Metastatic involvement of the heart and pericardium: CT and MR imaging. *Radiographics* 2001;**21**:439—49.
3. Okwuosa TM, Williams KA. "Mass-ive" infarction: case report and review of myocardial metastatic malignancies. *J Nucl Cardiol* 2008;**15**(5):719—26.
4. Wang K, Asinger RW, Marriott HJ. ST-segment elevation in conditions other than acute myocardial infarction. *N Engl J Med* 2003;**349**:2128—35.
5. Grizzard JB, Ang GB. Magnetic resonance imaging of pericardial disease and cardiac masses. *Cardiol Clin* 2007;**24**:111—40.